

551.506 (73) DETAILS OF THE WEATHER IN THE UNITED STATES.

GENERAL CONDITIONS.

The feature of the month which seems of greatest importance was the change which took place on the 18th from the dry to the wet type of weather for California. The rains in that State continued during the remainder of the month, being unusually heavy in the southern portion. Elsewhere in the United States with the single exception of the Lake region precipitation was deficient.

Temperature was below normal in New England and the extreme Northwest; elsewhere it was in excess by from 1° to 6°.

The storm of the 18th-19th in the Lake region was attended by winds of hurricane force.

CYCLONES AND ANTICYCLONES.

By W. P. DAY, Observer.

Low pressure areas were not so numerous as during the preceding month, but included some very severe storms off the North Atlantic coast, over the region of the Great Lakes, and during the third decade off the Pacific coast. Both the Alberta and South Pacific types greatly exceeded the normal. However, the South Pacific type did not make its appearance until after the disintegration of the great plateau HIGH which persisted during the first half of the month. High pressure areas were about normal as to type and rather strongly developed, as they usually are at this season.

Tables showing the number of HIGHS and LOWS by types follow:

LOWS.	Al- berta.	North Pa- cific.	South Pa- cific.	North- ern Rocky Moun- tain.	Colo- rado.	Texas.	East Gulf.	South At- lantic.	Cent- ral.	Total.
December, 1921..	9.0	1.0	5.0	1.0	1.0	1.0	1.0	19.0
Average number 1892-1912 inclu- sive.....	4.3	2.5	0.8	0.3	1.1	2.5	0.2	0.3	0.4	12.4

HIGHS.	North Pacific.	South Pacific.	Al- berta.	Pla- teau and Rocky Moun- tain Region.	Hud- son Bay.	Total.
December, 1921..	3.0	1.0	6.0	1.0	11.0
Average number, 1892-1912 inclusive	1.1	1.2	4.7	1.3	0.5	8.5

THE WEATHER ELEMENTS.

By P. C. DAY, Climatologist and Chief of Division.

[Weather Bureau, Washington, February 1, 1922.]

PRESSURE AND WINDS.

During the first half of the month high atmospheric pressure was maintained almost constantly over the Plateau region and the far Northwest, the average for this period being far above the normal and at points the highest pressures ever observed were recorded near the

first of the month. At the same time storm areas from the Pacific that usually enter the United States over the far Northwest were forced northward into the British possessions, moving thence southward into the United States east of the Rocky Mountains, and thence to the Atlantic coast. Some of these storms developed considerable energy in the region of the Great Lakes and further eastward, with the result that the average pressure during the first half of the month was less than normal over most central and eastern districts.

By the middle of the month high pressure had developed over the eastern portion of the country, the far western HIGH that had persisted so long showed signs of breaking up, and storm areas began to enter the United States at lower latitudes, with resultant heavy rains in California reaching to the southern extremity of the State.

During the latter half of the month strong anticyclonic areas entered the Missouri Valley States from the adjoining British Provinces in rapid succession, and moving eastward over the central valleys to the Atlantic coast dominated the weather from the Rocky Mountains eastward. During this period pressure remained low over the Pacific Coast States, particularly over the far Southwest, where heavy rains, high winds, and flood conditions were reported.

For the month as a whole, pressure averaged less than the normal over all districts from the Mississippi River eastward, although the departures were usually small. Over the Great Plains, Rocky Mountain regions, and the far Northwest, as well as in the western Canadian Provinces, the average pressure was above normal, while over California and the adjacent portions of the Plateau the averages were below normal.

The prevailing winds were variable to an unusual degree, but in the main they were from north to west points over the Great Plains, upper Mississippi Valley, Lake region, and Northeastern States, and from southerly points in the Ohio and lower Mississippi Valleys, and portions of the Gulf States.

High winds occurred over extensive areas and wide property damage resulted, particularly in connection with the storm over the Great Lakes and districts to the eastward on the 17th and 18th.

TEMPERATURE.

December on the whole was a warm month, only small areas in the extreme Northeast and the far Northwest having averages below the monthly normal. The month was distinctly warm in the southern portions of the country and over the Dakotas, where the average excess was about 6°, and at a few points in the Southeastern States the monthly averages were the highest of record for December.

The first half of the month had few important temperature changes, and generally mild weather for the season of the year prevailed in most districts.

About the 16th considerably colder weather over-spread the Plateau and Rocky Mountain districts and during the following few days extended rapidly eastward and southeastward, bringing the coldest weather of the month over many far western districts and the southern portions of the country as far east as the Middle Gulf States. Another period of moderately cold weather

prevailed over the northern districts from Montana eastward during the 20th to 22d, at which time the coldest weather of the month was experienced in portions of the Great Lakes region, the Ohio Valley, and Middle Atlantic States. This was quickly followed by a high barometric pressure area from the British Northwest Provinces, attended by the coldest weather of the month about Christmas over much of the country between the Rocky Mountains and the Mississippi River. The lowest temperature reported during the month, 41° below zero, at a point in Minnesota, occurred at this time.

The principal warm period of the month was from the 12th to 14th, when unusually high temperatures prevailed in the central valleys and far western districts. The maximum temperatures during this period were the highest of record for December at many points in the Great Plains region.

The continued warmth during the month over the Gulf States caused fruit trees in some sections to blossom, and it is reported by the Weather Bureau official at Due West, S. C., that a second crop of cherries ripened on several trees at that place, and well-developed apples of good flavor were picked and eaten.

PRECIPITATION.

On the whole the month had mostly deficient precipitation, particularly over the Atlantic and Gulf Coast States, the Great Plains, and far Northwest. There was a moderate excess in the States of the Ohio Valley and thence northward, and generally in the Rocky Mountain region, the central Plateau, and the far Southwest. The amounts received in southern California were far in excess of the usual fall.

The periods of extensive precipitation were the 1st to 3d, from the Southern Plains northeastward and eastward to the Atlantic, with heavy falls in eastern Texas and portions of the Mississippi Valley and Gulf States; on the 8th to 10th, when considerable areas in the Gulf States had substantial rains; on the 11th to 13th, when unusually heavy rains occurred in the far Northwest; on the 16th to 19th, when rain or snow prevailed in practically all districts from the Great Plains eastward, the rain being moderate to heavy over portions of the Middle Gulf States, the upper Mississippi Valley, and Great Lakes region.

At the end of the second and the first few days of the third decade there were unusually heavy rains in southern

California, and more or less rain or snow occurred over large areas of the Pacific Coast and Plateau States. About the 23d rain set in over the central valleys, and during the following two days extended into most eastern districts, with heavy falls in portions of the middle Mississippi and lower Ohio Valleys. Heavy rains again occurred over California and other portions of the far Southwest on the 26th and 27th.

The excessive rains in southern California caused much damage to property, and landslides in the State of Washington, due to heavy rains, caused the death of 10 or more persons. At the end of the month severe drought prevailed in portions of southern Florida and over the western portions of the southern Great Plains.

SNOWFALL.

In the regions from the Rocky Mountains eastward snowfall occurred over about the usual areas, but as a rule the amounts were light and less than normal. Rather heavy falls occurred over small areas in the mountains of Virginia, West Virginia, Maryland, and Pennsylvania, and depths of 5 to 10 inches or more had accumulated by the end of the month in the upper Lake region and northern New England.

In the western mountains no unusual falls were reported, and over the northern and central portions favorable reserves appeared to have accumulated in the high ranges. In the southern mountain districts the falls were usually light, and the stored reserves even at the highest elevations were far from encouraging.

RELATIVE HUMIDITY.

Sharp variations in the average relative humidity were observed, and positive and negative departures from the normal showed wide fluctuations over short distances. Notable instances are found in the middle Rocky Mountains where positive departures ranged from 8 to 14 per cent, while in the adjacent Southern Plains, negative departures of from 10 to 25 per cent occurred. At Phoenix, Ariz., the average relative humidity at 5 a. m. was 4 per cent below normal, while at Yuma in the same State it was 12 per cent above.

Generally speaking, the areas of heavy and light precipitation are fairly well outlined by the positive and negative departures of the relative humidity from the normal.